

[0025] **FIG. 3C** depicts a flow chart of how a new user is registered by the system of the invention.

[0026] **FIG. 4** depicts an exemplary system of the present invention for the storage of linkage codes on list servers.

DETAILED DESCRIPTION OF THE INVENTION

[0027] The system of the present invention is a modification of the invention described in "SYSTEM AND METHOD OF USING MACHINE-READABLE OR HUMAN-READABLE LINKAGE CODES FOR ACCESSING NETWORKED DATA RESOURCES", copending U.S. patent application Ser. No. 09/543,178, filed Apr. 5, 2000 by Hunter et al., previously incorporated herein by reference ("the copending application"). In the system described therein, a linkage code is a bar code that is scanned by a bar code scanner and input into a client software program that uses the decoded linkage code to request a URL template from an external server computer. The inputting of the code may also be performed by manually entering a text string associated with the code, such as by entering a UPC number found at the bottom of a typical UPC barcode. The linkage codes of the invention are not limited to UPC codes, however, and the invention supports European EAN codes, ISBN codes for books, as well as custom linkage code formats.

[0028] In a preferred embodiment of that invention, the linkage code includes two subcodes: a routing identification code ("RID") and an item identification code ("IID"). In the embodiment wherein the linkage code is a UPC code, the RID can be the manufacturer's portion of the UPC, whereas the IID can be the item code portion of the UPC. The client passes the RID to a routing server to obtain a URL link to a resolution server for that code, and the client completes the URL link by filing in the IID. The client then passes the completed URL link to the resolution server to obtain a target URL of content associated with the IID on the content server associated with the RID.

[0029] The two step resolution process allows for multiple resolution servers, thus providing scalability, with each server having its own database of target URLs. Since the address of a resolution server for a particular RID changes infrequently with respect to number of times a user seeks to access the content server associated with the RID, the RID obtained from the routing server can be cached on the client for rapid lookup. The RID thus obtained can be associated with an expiration date so that the RID is periodically refreshed.

[0030] The system of the invention also includes a user database maintained by a registration server. The first time a user utilizes the invention to, for example, scan a UPC barcode to access a web site associated with the product, the user is directed to a registration procedure wherein the user is prompted to enter demographic data about him or herself. This data can include the user's name, address, age, gender, preferred language, and preferred interests. The registration server returns a user identification code ("UID") to the client, which caches it. The UID is passed to the routing server, which can then access the user data base and fill user data into the template URL. The template URL is returned to the client, which fills in the UID and IID to complete the lookup-URL. The client then passes the lookup-URL to the

resolution server, which uses the user data along with a rules database to return a target-URL that addresses content specifically for that user. This feature of the invention is referred to as profiled routing.

[0031] Thus, the use of linkage codes is a powerful way of utilizing a general purpose computer to automatically access a web resource without having to type in a lengthy URL. Linkage codes are particularly useful in the context of wireless, hand-held web enabled devices such as cell phones, PDAs, or pocket personal computers ("pocket PCs"). Cell phones, for example, do not support the full alphabetic keyboard of a personal computer, and thus entering a full URL for a web site is quite tedious. Most phones use a metaphor in which numeric buttons are pressed multiple times to scroll through several letters and/or punctuation marks, with either a button press or a pause indicating acceptance of the current letter. For example, www.amazon.com is entered on a cell phone numeric keypad as 99900262999966666002226666. On the other hand, the associated linkage code is merely 92801726. The all digit linkage code is shorter and easier to enter than the full URL, and much more intuitive to use. The advantage of linkage codes is even more apparent for those handheld devices that include barcode scanners, such as PDA's.

[0032] Although some wireless, hand-held web enabled devices, such as Palm Pilots or other PDAs, could easily be provided with the client plug-in required to map the linkage code into a URL, cell phones are not so easily adapted. There is also a large number of cell phones already in use. The inventors have thus found that it is preferable to locate this functionality on another server, referred to herein as a URL-assembly server. This enables any wireless device user to utilize linkage codes to access web content by merely accessing the appropriate page of the URL-assembly server that provides the mapping, without the necessity of installing the plug-in on the wireless client device.

[0033] Referring now to **FIG. 2**, an exemplary system configuration for a web-enabled device, such as a PDA that supports an HTML display, is depicted. Device **200** can execute a web browser whose interface is displayed in display area **210**. When executing, the web browser can display the linkage code entry window, referred to as a go-window. The go-window includes a field **211** for entering a linkage code, and a button **212**. A user can key in or write in a linkage code in field **211** and activate button **212** to find the associated web page. Alternatively, if device **200** supports a scanner **213**, a barcode can be scanned in.

[0034] If device **200** is an Internet enabled device, such as a Palm VII PDA, it can transmit the linkage code just entered over the Internet to a URL-assembly server **202**. The device **200** can also optionally transmit a user identification ("UID") to the URL-assembly server **202**. If the device **200** is a WAP enabled cell phone that displays WML content, the transmission to the URL-assembly server **202** is typically mediated by a proxy server **201**, shown in **FIG. 2A**, that converts the WAP transmission into an HTTP compliant transmission. The URL assembly server **202** in turn communicates over the Internet with a registration server **203**, which maintains a database of user information **214**, and a routing server **204**, which maintains a resolution server database **215**. The URL-assembly server utilizes the RID portion of the linkage code, along with the UID, if available,